Remarks

This application has been reviewed in light of the Office Action of February 28, 2002. Claims 1-16 are pending. Claims 1-14 are rejected, claim 16 is allowed, and claim 15 is objected to. In response, claim 15 is amended to independent form, and the following remarks are submitted. Reconsideration of this application, as amended, is requested.

Although claims 1-14 are indicated as rejected in the Office Action Summary, Applicant can find no rejection of claim 11 in the Detailed Action.

Claims 1 and 3-5 are rejected under 35 USC 103 over Abell '925. Applicant traverses this ground of rejection.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art reference or references clearly do not arguably teach some limitations of the claims.

Claim 1 recites in part:

> "wherein each fiber has an input shape and size at its input end and an output shape and size at its output end, the output shape and size being different from the input shape and size"

At col. 4, lines 26-41, Abell teaches that it is the bundle of optical fibers that is reduced in size between the two ends. After describing the drawdown procedure, Abell clearly states that "optical fibers intersecting the larger end of each bundle are reduced in diameter to emerge in the same order at the smaller end of each bundle" (col. 4, line 35-38). Claim 1 recites "the output shape and size being different from the input shape and size", so that both shape and size must be different.

The explanation of the rejection asserts that "a change in the shape of the fiber end would have required only routine skill in the art." (Office Action, page 3, lines 2-3) Applicant strongly disagrees. Nothing in the art has any such teaching of this unique design. Further, Applicant went to great lengths to explain the advantages of this approach in achieving improved resolution and energy collection efficiency of the sensor system (page 6, lines 24).

The explanation of the rejection goes on to state (page 3, lines 3-7) a rationale for this claimed approach as being "to minimize loss of life [sic, light?] and to provide for use of a larger array of detectors." This rationale is not correct. The optical fiber has total internal reflection whatever its shape, so that loss of light is not an issue. Regarding detector array size, the limit on detector array size is the ability to make large detectors, not the ability to conduct light from the detector.

The explanation of the rejection then relies on "obvious design choice" (page 3, line 7-12). The concept of "obvious design choice" is not intended to substitute for statutory prior art. It provides a means by which one of several realistic alternatives presented by statutory prior art may be selected, absent surprising or unexpected advantages. It is to be used only where the applied statutory prior art sets forth a list of realistic alternative selections, and it would be an obvious design choice to select one member from the list. In this case, the prior art of record presents no such design choice, and accordingly the application of "obvious design choice" is not appropriate here. This amounts to a "well known in the art" type of rejection. Applicant traverses this approach, and asks for the citation and application of proper statutory prior art or other evidence supporting the rejections, MPEP 2144.03. If the rejection is maintained, Applicant asks that the Examiner cite and apply statutory prior

art, pursuant to MPEP 2144.03.

In short, the concept of changing the shape and size of the optical fiber between its input and output ends, in a sensor system like that recited, is not suggested by the prior art of record. Applicant has carefully explained the advantages achieved using this approach.

Regarding claim 3, Abell does teach the shape of the fiber ends. Abell speaks of their "diameter", indicating that they have a conventional circular cross sectional shape. (col. 4, lines 27-41)

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claim 2 is rejected under 35 USC 103 over Abell '925 in view of Kern '624. Applicant traverses this ground of rejection.

Claim 2 incorporates the limitations of claim 1, and is not taught by Abell for the reasons stated above, which are incorporated here. Kern adds nothing in this regard.

Additionally, claim 2 recites in part:

"a color filter positioned between the scene and the detector"

That is, the color filter is a different physical element from the detector. See the two different color filters 30 and 50 of Figure 1 of the present application.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claim 6 is rejected under 35 USC 103 over Abell '925 in view of McKinley '345. Applicant traverses this ground of rejection.

Claim 6 incorporates the limitations of claim 1, and is not taught by Abell for the reasons stated above, which are incorporated here. Kern adds nothing in this regard.

McKinley teaches remapping for photolithography, laser ablation, and the like to control intensity distribution (col. 1, lines 5-8). McKinley has no relation to imaging

sensors. Accordingly, McKinley is nonanalogous art. Stated alternatively, McKinley is not within the scope and content of the prior art that may be used in forming a sec. 103 rejection. Its teachings are therefore not properly combined with the teachings of Abell. To be analogous art and properly used in forming a sec. 103 rejection, a reference must be concerned with the same problem as another reference and the claims which are being addressed. See, for example, Medtronic, Inc. v. Cardiac Pacemaker, Inc., 220 USPQ 97, 104 (Fed. Cir. 1983), stating: "Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of others faced with rate-limiting problems." Also, Stratoflex, Inc. v. Aeroquip Corp., 218 USPQ 871, 876 (Fed. Cir. 1983), stating: "The scope of the prior art has been defined as that 'reasonably pertinent to the particular problem with which the inventor was involved.'" In the present case, the inventors were concerned with a problem in imaging sensors, see Background section of the Specification. McKinley has nothing at all to do with imaging sensor, and therefore is not properly within the scope of the prior art. It is therefore not properly applied in rejecting the present claims.

A person reading McKinley would have no teaching that it would be useful to perform a nonlinear mapping on a detector, as recited in claim 6. The nonlinear mapping of an image onto the detector achieves advantageous results discussed in the present application at page 6, line 25-page 7, line 1, and particularly page 6, line 32-page 7, line 1.

The explanation of the rejection (page 4, last two lines on page) correctly characterizes McKinley as seeking more uniform light through his approach, see col. 4, line 1 where McKinley describes his illustrated device as "homogenizer 10". That of course is not the objective or functionality in an imaging device--one does not seek to achieve more uniform light intensity, because the nonuniformities in the light intensity are what define the nature of the image.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 7-10 and 12-14 are rejected under 35 USC 103 over Abell '925 in view

of Kern '624. Applicant traverses this ground of rejection.

Abell and Kern have been discussed above, and that discussion is incorporated here.

Claim 7 recites in part:

> "the first-color output shape and size being different from the first-color input shape and size"

with a similar recitation for the second-color optical fibers.

Abell has no such teaching, see the prior discussion of the rejection of claim 1 which is incorporated here. Kern has no such teaching.

Claim 7 further recites:

> "an imaging detector which converts incident light energy into an electrical signal, the imaging detector having
>
> a first-color region, and
>
> a second-color region"

Kern's device uses two detectors in order to process two different types of radiation. There is no teaching of an imaging detector with two different color regions on that one detector. The explanation of the rejection asserts that "mere duplication of the essential working parts of a device involves only routine skill in the art." But that is not what is happening here. In each of Abell and Kern, there are two or more detectors. The present invention has discovered how it is not necessary or desirable to have two or more detectors, and only one detector with two different color regions is used. Such an approach is made possible by using color filters, and neither Abell nor Kern has any such teaching.

The explanation of the rejection does not address the limitations of dependent claims 8-10 and 12-14. In each case, the references do not teach the recited limitations.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Applicant submits that the application is in condition for allowance, and requests such allowance.

This paper is filed by the undersigned, who is not presently an attorney of record, pursuant to 37 CFR 1.34(a), MPEP 405, at the instruction of the attorney of record.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

underlined material is to be inserted, [bracketed] material is to be deleted, and --material set off by dashes-- is to be added.

Claims:

15. (Amended) [The sensor system of claim 7] A sensor system for viewing light energy from a scene, comprising:

an imaging detector which converts incident light energy into an electrical signal, the imaging detector having

a first-color region, and

a second-color region;

a first-color imaging system comprising:

a first-color filter positioned between the scene and the first-color region of the imaging detector,

a first-color optical train that focuses first-color scene energy onto the first-color region of the imaging detector, wherein the first-color scene energy from the first-color optical train is mapped nonlinearly onto the first-color region of the imaging detector, and

a first-color optical fiber bundle having a first-color input end that receives the first-color scene energy from the first-color optical train and a first-color output end that directs the first-color scene energy onto the first-color region of the imaging detector, the first-color optical fiber bundle comprising a plurality of first-color optical fibers wherein each of the first-color optical fibers has a first-color fiber input shape and size at its first-color input end and a first-color output shape and size at its first-color output end, the first-color output shape and size being different from the first-color input shape and size; and

a second-color imaging system comprising:

a second-color filter positioned between the scene and the second-color region of the imaging detector,

a second-color optical train that focuses second-color scene energy onto the second-color region of the imaging detector, and

a second-color optical fiber bundle having a second-color input end that receives the second-color scene energy from the second-color optical train and a second-color output end that directs the second-color scene energy onto the second-color region of the imaging detector, the second-color optical fiber bundle comprising a plurality of second-color optical fibers wherein each of the second-color optical fibers has a second-color fiber input shape and size at its second-color input end and a second-color output shape and size at its second-color output end, the second-color output shape and size being different from the second-color input shape and size.